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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WEST, JEFFREY R	

ART UNIT	PAPER NUMBER
2857	

DATE MAILED: 11/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/669,382	LYNAUGH ET AL.	
	Examiner	Art Unit	
	Jeffrey R. West	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5-7,10-13,22,23 and 25-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26-39* is/are allowed.

6)☒ Claim(s) *1,2,5-7,10-13,22,23,25,40-44 and 47-54* is/are rejected.

7)☒ Claim(s) *45 and 46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 5, 10, 22, 25, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,131,023 to Matsuura in view of U.S. Patent No. 5,452,473 to Weiland et al. and further in view of U.S. Patent No. 5,469,115 to Peterzell et al. and U.S. Patent No. 6,285,960 to Fung et al.

Matsuura teaches a set-top cable modem device including a cable modem comprising a receiver unit, tuner, and automatic gain control circuit (column 5, line 66 to column 6, line 6 and column 6, lines 4-29). Matsuura also teaches, in operation, using an analog IF signal and a baseband signal for demodulating a received signal wherein the automatic gain control circuit is controlled by the demodulation operation (column 8, lines 45-58) according to the input level of the QAM input signal supplied to the automatic gain control circuit (column 11, lines 50-55).

Matsuura therefore teaches the general structure of a cable modem device used to perform demodulation, but does not provide any method for calibrating or insuring accurate operation of the demodulation device.

Weiland teaches reverse link, transmit power correction and limitation in a radiotelephone system comprising a receiver that includes a linearizer table (i.e. look-up table) stored in the device that, during factory calibration, receives and stores a plurality of calibration signals having known frequencies, input RF power values, and error control values for use in actual operation (column 3, lines 46-65) wherein the error values are determined by an automatic gain control circuit (column 3, line 66 to column 4, line 5). Weiland also teaches using the linearizer look-up table, containing the aforementioned frequency and power parameters, to obtain correct input power adjustments required for the radio receiver's demodulation operation (column 3, lines 26-40).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsuura to include a method for calibrating the demodulating process, specifically using a linearizer look-up table, as taught by Weiland, because, as suggested by Weiland, the combination would have provided a method for removing error in receiving and transmitting functions (column 3, lines 57-61) and controlled the process to insure that the output power remains within a required range (column 2, lines 31-41).

Although the combination of Matsuura and Weiland teaches using a linearizer look-up table to determine an input power adjustment value instead of the actual power value itself, these methods are considered to be functionally equivalent since the combination of Matsuura and Weiland uses the correction value to obtain the actual power value. Also, since it is well-known in the art that look-up tables present

a clear relationship between a set of stored values in order to obtain a desired output from corresponding known inputs, it would have been obvious to one having ordinary to use the look-up table of Matsuura and Weiland to obtain any desired output by reading in the necessary inputs.

As noted above, the combination of Matsuura and Weiland teaches many of the features of the claimed invention. The combination, however, does not specifically teach specifying that the error-controlling signal of the automatic gain controller be an accumulated error value output by an integrator or interpolating the data in the linearizer look-up table.

Peterzell et al. teaches a method and apparatus for automatic gain control in a digital receiver wherein the automatic gain control apparatus includes a saturating integrator that compares a received power signal to a reference signal and produces the gain control signal by integrating or by refraining from integration based upon the reference values (column 2, lines 37-49) wherein the integrator includes an error accumulator (column 10, lines 11-21).

Fung teaches a method and apparatus for a router line card with adaptive selectable gain control for use in a cable environment (column 5, lines 31-35) wherein actual calibration data is stored a memory along with a nominal adjustment value and non-nominal adjustment values are interpolated and extrapolated using each of the known nominal adjustment values (column 2, lines 45-67).

It would have been obvious to one having ordinary skill in the art to modify the invention Matsuura and Weiland to include specifying that the error-controlling signal

of the automatic gain controller be an accumulated error value output by an integrator, as taught by Peterzell, because, as suggested by Peterzell, the combination would have provided an apparatus, similar to that of Matsuura and Weiland, for implementing automatic gain control that would have allowed inexpensive control of received signal power over a wide dynamic range (column 2, lines 25-30).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsuura and Weiland to include interpolating the values of the linearizer look-up table, as taught by Fung, because Fung suggests a method for estimating the needed adjustment values for inputs that do not have an actual nominal stored calibration value, therefore allowing adjustment of a wider variety of input parameters (column 9, lines 53-67).

3. Claims 13 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura in view of Weiland, Peterzell, and Fung, and further in view of U.S. Patent No. 5,027,376 to Friedman et al.

As noted above, Matsuura in combination with Weiland, Peterzell, and Fung teaches all of the features of the claimed invention except for specifying that the data in the look-up table be stored as 8-bit data.

Friedman teaches a data telecommunications system including a modem (column 5, lines 62-66) and a memory storing a plurality of tables including a

frequency table (column 6, lines 59-68). Friedman also teaches storing data in the table in 8-bit form (column 7, lines 5-10).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsuura, Weiland, Peterzell, and Fung to include specifying that the data in the look-up table be stored as 8-bit data, as taught by Friedman, because the combination would have provided a functionally equivalent method for storing data in a table and, as suggested by Friedman, increased the speed of look-up and data transmission due to smaller groupings of bits (column 6, lines 22-26 and column 7, lines 2-5)

4. Claims 6, 7, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura in view of Weiland, Peterzell, and Fung, and further in view of U.S. Patent No. 6,539,128 to Lee et al.

As noted above, Matsuura in combination with Weiland, Peterzell, and Fung teaches many of the features of the claimed invention and while the combination does teach interpolating and extrapolating data in a table using/at each of the known data points, the combination does not specify what type of interpolation/extrapolation to perform.

Lee teaches a method and apparatus for performing interpolation between two points of known data (column 2, lines 5-10). Lee also teaches the well-known interpolation methods of linear interpolation (i.e. first-order) and quadratic interpolation (i.e. second order) (column 1, lines 8-67).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsuura, Weiland, Peterzell, and Fung to include specifying performing first or second order interpolation, as taught by Lee, because while the combination of Matsuura, Weiland, Peterzell, and Fung is silent on the type of interpolation to perform Lee suggests two well-known interpolation methods, applicable in the noted combination, that would have allowed the user to choose between fast linear interpolation or slower, more accurate, second-order interpolation, as desired (column 1, lines 60-64).

Although the combination of Matsuura, Weiland, Peterzell, Fung, and Lee does not specifically disclose performing extrapolation using linear projection, since the combination does teach performing interpolation and extrapolation and also teaches that the interpolation be linear, one with ordinary skill in the art would also perform linear extrapolation (i.e. linear projection) in order to obtain similar corresponding results.

5. Claims 40-42, 47, 51, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura in view of Weiland, Peterzell, and Fung, and further in view of U.S. Patent No. 6,606,615 to Jennings et al.

As noted above, the invention of Weiland, Peterzell, and Fung teaches all of the features of the claimed invention except for specifying that generating the look-up table includes scaling the data using maximum and minimum values for the data.

Jennings teaches a forecasting contest that produces forecasting data for pre-designated variables whose values change over time (abstract) wherein the device stores and/or graphs historical and prediction data for the current value (column 33, lines 50-51) and the graphical presentation of the data is scaled based on the maximum and minimum data values over the graphed interval (column 34, lines 1-5)

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsuura, Weiland, Peterzell and Fung to include specifying that generating the look-up table includes scaling the data using maximum and minimum values for the data, as taught by Jennings, because the combination would have provided a method for insuring that the data in the table is stored over a reasonable range to reduce the amount of memory needed for storage while maintaining accurate data and, as suggested by Jennings, allowed the use of the most appropriate range of data (column 26, lines 49-58) to optimize the graph/table when the table includes different types of data (column 27, lines 27-41).

6. Claims 50 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura in view of Weiland, Peterzell, Fung, and Jennings and further in view of U.S. Patent No. 5,027,376 to Friedman et al.

As noted above, Matsuura in combination with Weiland, Peterzell, Fung, and Jennings teaches all of the features of the claimed invention except for specifying that the data in the look-up table be stored as 8-bit data.

Friedman teaches a data telecommunications system including a modem (column 5, lines 62-66) and a memory storing a plurality of tables including a frequency table (column 6, lines 59-68). Friedman also teaches storing data in the table in 8-bit form (column 7, lines 5-10).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsuura, Weiland, Peterzell, Fung, and Jennings to include specifying that the data in the look-up table be stored as 8-bit data, as taught by Friedman, because the combination would have provided a functionally equivalent method for storing data in a table and, as suggested by Friedman, increased the speed of look-up and data transmission due to smaller groupings of bits (column 6, lines 22-26 and column 7, lines 2-5)

7. Claims 43, 44, 48, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura in view of Weiland, Peterzell, Fung, and Jennings and further in view of U.S. Patent No. 6,539,128 to Lee et al.

As noted above, Matsuura in combination with Weiland, Peterzell, Fung, and Jennings teaches many of the features of the claimed invention and while the combination does teach interpolating and extrapolating data in a table using/at each of the known data points, the combination does not specify what type of interpolation/extrapolation to perform.

Lee teaches a method and apparatus for performing interpolation between two points of known data (column 2, lines 5-10). Lee also teaches the well-known

interpolation methods of linear interpolation (i.e. first-order) and quadratic interpolation (i.e. second order) (column 1, lines 8-67).

It would have been obvious to one having ordinary skill in the art to modify the invention of Matsuura, Weiland, Peterzell, Fung, and Jennings to include specifying performing first or second order interpolation, as taught by Lee, because while the combination of Matsuura, Weiland, Peterzell, Fung, and Jennings is silent on the type of interpolation to perform Lee suggests two well-known interpolation methods, applicable in the noted combination, that would have allowed the user to choose between fast linear interpolation or slower, more accurate, second-order interpolation, as desired (column 1, lines 60-64).

Although the above combination does not specifically disclose performing extrapolation using linear projection, since the combination does teach performing interpolation and extrapolation and also teaches that the interpolation be linear, one with ordinary skill in the art would also perform linear extrapolation (i.e. linear projection) in order to obtain similar corresponding results.

Allowable Subject Matter

8. Claims 26-39 are considered to be allowable over the cited prior art because while the invention of Mohindra teaches that an audio tone can have a sinusoidal form, none of the cited prior art teaches or suggests, in combination with the other claimed limitations for estimating the input power in a cable modem device having a tuner and a modem, interpolating the frequency, input power, and

accumulated error values using an audio tone or a known voltage variable amplifier curve.

9. Claims 45 and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims because none of the cited prior art teaches or suggests, in combination with the other claimed limitations for estimating the input power in a cable modem device having a tuner and a modem, interpolating the frequency, input power, and accumulated error values using an audio tone or a known voltage variable amplifier curve.

Response to Arguments

10. Applicant's arguments with respect to claims 1, 2, 5-13, 22, 23, and 25-54 have been considered but are moot in view of the new ground(s) of rejection. The following arguments, however, are noted.

Applicant argues the rejection of claim 1, and similarly claims 22 and 54, for lacking a teaching of "a modem having a receiver including *an AGC circuit with an integrator outputting an accumulated error value.* In contrast, the cited combination of prior art references fails to teach or suggest an integrator outputting an error value for an AGC circuit. Matsuura does not teach or suggest the use of any integrator. Weiland only teaches a 'power detector (214) [that] includes an integrator that

integrates [*not an accumulated error, but*] the detected power with respect to a reference voltage."

The Examiner asserts that it is not the inventions of Matsuura or Weiland that are included to teach the AGC circuit with an integrator outputting an accumulated error value. Instead the invention of Peterzell et al. teaches a method and apparatus for automatic gain control in a digital receiver wherein the automatic gain control apparatus includes a saturating integrator that compares a received power signal to a reference signal and produces the gain control signal by integrating or by refraining from integration based upon the reference values (column 2, lines 37-49) wherein the integrator includes an error accumulator (column 10, lines 11-21).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

U.S. Patent No. 5,465,205 to Kamiya teaches an automatic gain control apparatus including an integrator means for computing the integrated error value output from an adder means.

U.S. Patent No. 6,072,902 to Myers teaches a method and system for color matching between digital display devices including a lookup table of scaled and interpolated ratio values.

U.S. Patent No. 5,764,546 to Bryant et al. teaches a DAQ configuration system and method for configuring channels in a data acquisition device including a lookup

table performing linear interpolation between the raw and scaled value pairs wherein no linear interpolation is done beyond the maximum and minimum table values, so the lookup table should be greater than or equal to the raw and scaled (physical) ranges of the channel being scaled.

U.S. Patent No. 5,339,109 to Hong teaches an apparatus for interpolating scanning lines of TV signal in TV including an adder for adding an output signal from said variable amplifier to the diagonal interpolation signal from said diagonal interpolation signal generating means.

U.S. Patent No. 6,148,047 to Mohindra teaches DC offset compensation for zero IF quadrature demodulator wherein a supervisory audio tone has a sinusoidal form.

JP Patent No. 04-267613 to Inami teaches an AGC circuit for setting the gain of a gain variable amplifier circuit with a digital control signal resulting from interpolating the digital control circuit from a control signal output circuit.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (703)308-1309. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703)308-1677. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

jrw
November 17, 2003

MARC S. HOFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800